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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/567,370	02/07/2006	Carlo Cavazzoni	05788.0387	9868

7590 03/03/2009
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EXAMINER

DOBSON, DANIEL G

ART UNIT	PAPER NUMBER
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2613

MAIL DATE	DELIVERY MODE
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03/03/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/567,370	Applicant(s) CAVAZZONI ET AL.	
	Examiner DANIEL G. DOBSON	Art Unit 2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) 1-17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 18-32 is/are rejected.
- 7) ☒ Claim(s) 33 and 34 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>02/07/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 18-24 and 30-32 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 6,411,412 B1 to Jiang et al. (and U.S. Patent 6,288,811 B1 to Jiang et al. (*Jiang2*) incorporated by reference.)

As to **Claim 18**, *Jiang* discloses a packet and optical routing equipment, comprising:

optical input means suitable for receiving input multiplexed signals (Fig. 3, input to ADM (320) having multiplexed signals);

optical output means suitable for supplying output multiplexed signals (Fig. 3, output from ADM (320) having multiplexed signals);

a non-packet optical port suitable for exchanging branch non-packet signals (Fig. 3, port containing paths 385-388 are suitable for non-packet signals);

a packet optical port suitable for exchanging branch packet signals (Fig. 3, port containing paths (381-384) are suitable for packet (cell format) signals);

an optical forwarding and multiplexing stage coupled between said optical input and said optical output (Fig. 3, ADM 320);

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a packet forwarding stage connected between said optical packet port and said optical forwarding and multiplexing stage (Fig. 3, 430, cell format (packet) module);

a non-packet optical/electric converter connected to said non-packet optical port and suitable for converting said branch non-packet signals into and from non-packet electric signals (Fig. 3, 354, O/E's connected to non-packet port (385-388) suitable for converting non-packet signals (TDM));

a packet optical/electric converter connected between said optical packet port and said packet forwarding stage, said packet optical/electric converter being suitable for converting said branch packet signals into and from electric packet signals exchanged with said packet forwarding stage (Fig. 3, 353 O/E's connected between the ports (381-384) and the forwarding stage (430) suitable for converting packet signals (cell format));

an electric switching unit connected to said non-packet optical/electric converter and said packet forwarding stage for exchanging therewith said electric non- packet and packet signals (Fig. 3, 410 and 420 which may be combined as one unit for routing the packet and non-packet signals, Col. 7, ll. 31-6); and

an interface converter coupled between said electric switching unit and said optical forwarding and multiplexing stage for converting said electric non-packet and packet signals into and from optical signals supplied to and from said optical forwarding and multiplexing stage (Fig. 3, 332, optical network interface, converts both types of signals into optical for adding to the network.)

As to **Claim 19**, *Jiang* discloses wherein said electric switching unit has a first plurality of input/outputs connected to said non-packet optical/electric converter (Fig. 3, 421 and 422 connected through TDM format module (440) to the O/E converter (352)), a second plurality of input/outputs connected to said packet forwarding stage (Fig. 3, ports 412 and 421 connected to cell format module (430) (packet forwarding stage) and a third plurality of input/outputs connected to said interface converter (Fig. 3, ports 413, 414, 415, and 416 connected to interface converter (332, optical network interface), said electric switching unit being configured to connect a variable number of input/outputs of said first and second plurality to said third plurality of input/outputs (Col. 6, ll. 55-64.)

As to **Claim 20**, *Jiang2* discloses wherein said optical input means comprises a first and a second input (Fig. 3, W-E input at top left and E-W input at lower right) and said optical output means comprises a first and a second output (Fig. 3, converse of inputs);

said optical forwarding and multiplexing stage comprising a first set of cascade connected optical add/drop multiplexers and a second set of cascade connected add/drop multiplexers (Fig. 3, first set for wavelengths 1 and 2 and second set for wavelengths a and b.)

As to **Claim 21**, *Jiang2* discloses wherein said first set of ADM's is coupled between said first input and said first output and said second set of

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optical ADM's is coupled between said second input and said second output (Fig. 3.)

As to **Claim 22**, *Jiang*2 discloses wherein said optical ADM's are of a tunable type (Col. 8, ll. 15-24.)

As to **Claim 23**, *Jiang* discloses wherein said interface converter comprises a plurality of transceivers, each transceiver being connected to a respective one of said optical add/drop multiplexers (Fig. 3, 332, one transceiver for each wavelength.)

As to **Claim 24**, *Jiang* discloses wherein each said transceiver comprises a transmitter of tunable type (Fig. 3, transponders convert the signals to the desired wavelength), a gray receiver (absence of tunable filter at the receivers implies a gray receiver) and an electronic unit (electronic units are required for bias/modulation current in the transmitter and clock and data recovery of the receivers.)

As to **Claim 30**, *Jiang* discloses an optical network of wavelength multiplexing type (Fig. 3), comprising a plurality of packet and optical routing equipment (Fig. 3, ADM's 320, 320', 340, and 340', switches/routers 410, 420, 430, 440 and copies for protection path) and a plurality of optical connections extending between pairs of packet and optical routing equipment (Fig. 3, fibers to other similar nodes), each said packet and optical routing equipment comprising:

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optical input means connected to a first of said optical connections and receiving input multiplexed signals (Fig. 3, input from other nodes to ADM (320) having multiplexed signals);

optical output means connected to a second of said optical connections and for supplying output multiplexed signals (Fig. 3, output from ADM (320) having multiplexed signals to other nodes);

a non-packet optical port for exchanging branch non-packet signals (Fig. 3, port containing paths 385-388 for non-packet signals);

a packet optical port for exchanging branch packet signals (Fig. 3, port containing paths (381-384) for packet (cell format) signals);

an optical forwarding and multiplexing stage coupled between said optical input and said optical output (Fig. 3, ADM 320);

a packet forwarding stage connected between said optical packet port and said optical forwarding and multiplexing stage (Fig. 3, 430, cell format (packet) module); each said packet and optical routing equipment comprising (Fig. 3 one for each wavelength, Col. 6, ll. 59-64)

a non-packet optical/electric converter connected to said non-packet optical port and suitable for converting said branch non-packet signals into and from non-packet electric signals (Fig. 3, 354, O/E's connected to non-packet port (385-388) suitable for converting non-packet signals (TDM));

a packet optical/electric converter connected between said optical packet port and said packet forwarding stage, said packet optical/electric converter

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being suitable for converting said branch packet signals into and from electric packet signals exchanged with said packet forwarding stage (Fig. 3, 353 O/E's connected between the ports (381-384) and the forwarding stage (430) suitable for converting packet signals (cell format));

an electric switching unit connected to said non-packet optical/electric converter and said packet forwarding stage for exchanging therewith said electric non- packet and packet signals (Fig. 3, 410 and 420 which may be combined as one unit for routing the packet and non-packet signals, Col. 7, ll. 31-6); and

an interface converter coupled between said electric switching unit and said optical forwarding and multiplexing stage for converting said electric non-packet and packet signals into and from optical signals supplied to and from said optical forwarding and multiplexing stage (Fig. 3, 332, optical network interface, converts both types of signals into optical for adding to the network.)

As to **Claim 31**, *Jiang* discloses a method for packet and optical signal routing, comprising the steps of:

receiving input multiplexed optical signals (Fig. 3, input to ADM (320) having multiplexed signals);

receiving branch non-packet optical signals (Fig. 3, port containing paths 385-388 for non-packet signals);

receiving branch packet optical signals (Fig. 3, port containing paths (381-384) for packet (cell format) signals);

forwarding first selected of said input multiplexed optical signals as output multiplexed optical signals (*Jiang2* Fig. 3, wavelengths not selected for dropping by the channel selectors are passed through the ADM);

extracting second selected of said input multiplexed optical signals and adding said branch non-packet and packet optical signals to said output multiplexed optical signals (*Jiang2* Fig. 3, extracted (dropped) channels are replaced with signals having non-packet and packet optical signals (Fig. 1) which are outputted from the ADM);

said step of adding said branch non-packet and packet optical signals to said output multiplexed optical signals comprising:

converting said received branch non-packet and packet optical signals into non-packet and packet electric signals (Fig. 3, 352, converts the non-packet and packet optical signals into electric signals);

switching said non-packet and packet electric signals according to available resources (Fig. 3, format modules (410, 420, 430, and 440) route the non-packet and packet electric signals to the desired wavelengths, Col. 6, ll. 55-63);

converting the switched non-packet and packet electric signals into optical signals (Fig. 3, 332, optical network interface converts the electrical signals to optical signals); and

adding said optical signal to said output multiplexed signals (Fig. 3, the optical signals for adding are multiplexed onto the system via ADM (320)).

As to **Claim 32**, *Jiang* discloses converting said second selected of said input multiplexed signals into extracted electrical signals (Fig. 3, signals selected for dropping in the ADM (320) are converted into electrical signals in the optical network interface (332);

switching said extracted electric signals to obtain first and second electric signals (Fig. 3, first electric signals (non-packet) are sent the TDM format modules (420 and 440) and second electric signals (packet) are sent to the cell format modules (410 and 430));

converting said first electric signals into branch non-packet optical signals (Fig. 3, optical network interface converts the electric signals into optical signals);

sending said branch non-packet optical signals to a non-packet destination (Fig. 3, ADM (340) sends the signals to their desired destination);

converting said second electric signals into branch packet optical signals (Fig. 3, optical network interface converts the electric signals into optical signals);

sending said branch packet optical signals to a packet destination (Fig. 3, ADM (340) sends the signals to their desired destination.)

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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4. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,411,412 B1 to Jiang et al. and U.S. Patent 7,263,091 B1 to Woo et al.

As to **Claim 25**, *Woo* discloses wherein said packet forwarding stage comprising a packet forwarding module (Fig. 3, 60A) coupled between said electric switching unit (Fig. 3, 58A) and said packet optical/electrical converter (Fig. 3, 63) suitable for generating control signals (Col. 5, ll. 43-55, the forwarding stage reads the forwarding information and controls the routers accordingly.) This functionality is suitable for application in the packet and optical control plane disclosed by *Jiang*, i.e. the transceivers, switches/routers, and ADM's.

Woo and *Jiang* are from the same art with respect to communications, and are therefore analogous art.

At the time of the invention, it would have been obvious for a person of ordinary skill in the art to use the forwarding engine disclosed by *Woo* to control the control plane disclosed by *Jiang*. The suggestion/motivation would have been to send the packets to properly routed while allowing for easy reconfiguration and scalability (ABST.)

5. Claims 26-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,411,412 B1 to Jiang et al. and U.S. Patent 7,263,091 B1 to Woo et al., as applied above, and further in view of U.S. Patent 6,256,125 B1 to Uehara.

As to **Claim 26**, *Uehara* discloses wherein said optical input and output means comprise channel termination units (Fig. 4, 19) suitable for extracting and/or adding control signals having different wavelength with respect to said

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input and output multiplexed signals (Col. 6, ll. 10-25, the termination unit receives information about the payload wavelengths which is passed on to the controller for the node.)

Uehara is from the same art with respect to optical communication, and is therefore analogous art.

At the time of the invention, it would have been obvious for a person of ordinary skill in the art to use the channel termination units disclosed by *Uehara* in the system disclosed by *Jiang*. The suggestion/motivation would have been to send control information about the payload signals w/o limiting the available bandwidth for them.

As to **Claim 27**, because the supervisory signal contains control information about the payload signals, it would be obvious to connect the units to the packet forwarding module. The suggestion/motivation would have been to read information about the packets (much the same as accomplished by *Woo* without sacrificing the bandwidth lost by in-band signaling.

As to **Claim 28**, *Uehara* discloses wherein said packet and optical control plane (Fig. 4, controller) are suitable for generating control signals for said optical forwarding and multiplexing stage (Fig. 4, controller controls optical switch) and wherein said optical forwarding and multiplexing stage is configured to route first selected of said input multiplexed signals toward said optical output means (Fig. 4, through signals are passed through) to extract second selected of said input multiplexed signals toward said interface converter and to add said optical

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signals to said output multiplexed signals (Fig. 4, signals selected to be dropped are sent down the drop channels. The suggestion/motivation is the same as that used in the rejection for claim 26.

6. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,411,412 B1 to Jiang et al. and U.S. Patent 6,256,125 B1 to Uehara.

As to **Claim 29**, *Jiang* discloses wherein said optical input means comprises a plurality of inputs and said optical output means comprises a plurality of outputs (Fig. 3, W-E input at top left and E-W input at lower right and outputs conversely.)

Uehara discloses wherein said optical forwarding and multiplexing stage comprises an optical switching unit connected to said interface converter and a multiplexing/demultiplexing unit connected between said optical switching unit and said inputs and outputs (Fig. 4, switches (17-1 to 17-n) connected to drop paths (which are connected to the interface converter of *Jiang*) and a mux/demux unit (Fig. 4, 15 and 18) connected between said switching unit and said inputs (Fig. 4, left side) and said outputs (Fig. 4 right side.)

At the time of the invention, it would have been obvious for a person of ordinary skill in the art to use the switch type ADM (*Uehara*) in place of the filter type ADM disclosed by *Jiang*. The suggestion/motivation would have been to use a switch that has the same functionality.

Allowable Subject Matter

7. Claims 33 and 34 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DANIEL G. DOBSON whose telephone number is (571)272-9781. The examiner can normally be reached on Mon. - Fri. 8:00 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Vanderpuye can be reached on (571) 272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/Daniel G. Dobson/
Examiner, Art Unit 2613
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/Kenneth N Vanderpuye/
Supervisory Patent Examiner, Art Unit 2613